

January 13, 2022

Mr. Rusty Rives, Assistant City Administrator  
City of Lamar  
1104 Broadway St.  
Lamar, MO 64759

vía email: [RRIVES@LAMARMO.ORG](mailto:RRIVES@LAMARMO.ORG)

Dear Rusty,

Thank you for inviting us to review the Lamar Aquatic Park. We visited the site on August 10<sup>th</sup> and met with you, Heidi Johnson, and Rio Gardner. Since then, the City staff has provided results from performing extensive testing and inspection of the below grade piping. This letter is our brief review of the swimming pools and our thoughts on repair options to consider.

### **Observations and Understanding**

#### **History**

- Facility was designed by Councilman Hunsaker.
- Pool Contractor was K.C. Gunite.
- Opened to public in 1996.
- In 2016 a French drain was installed around hillside to manage saturated ground.
- In 2018 the facility was closed due to excessive water loss.
- In the fall of 2018 and spring of 2019 below-grade piping repairs were made.
- In 2019 the facility reopened.
- The facility was open 2020.

#### **Indoor pool**

- Basin
  - Water surface area: 1165 s.f.
  - Pool basin was filled with water and in operation, so a visual inspection of the condition was limited.
  - Pool coating is wearing thin and should be considered for sandblasting and recoating.
  - Ladder rails, ramp rails, and grab bars appear to be in good shape.
  - Main drains/suction outlets were not inspected but there is no certification indicating compliance with federal VGB law. Corrections are necessary based on design.
- Deck
  - Deck drains are low quality products and will require routine maintenance. There are some areas where the drain grates have been compromised and need replaced.
  - Deck structure appears to be in good shape.
- Below Grade Piping
  - Below grade plumbing was not tested so the condition is not known.

- Treatment Systems
  - Generally, mechanical and water treatment components are functioning and require routine maintenance. Need to replace valve, meters, and gauges. Pool heater has recently failed and has been repaired.
- Miscellaneous
  - Mechanical area ventilation is inadequate and causing excessive corrosion to electrical and metal components.
  - HVAC system for the natatorium does not appear to be adequate based on observation of the natatorium building as well as staff testimony.

### **Outdoor Competition Pool**

- Basin
  - Water surface area: 3230 s.f.
  - The basin appears to be in good shape but there are some areas at the gutter that have spalled and cracked.
  - Wet ground on west side of deck occurs due to water loss (when water is above gutter lip). Staff reports waterloss when water is above gutter lip.
  - Gutter lip is ¼" lower on deep end of pool than the shallow end.
  - Stainless steel gutter has some broken and offset weld seams that need to be rewelded.
  - Pool coating is getting thin and has some blistering. It should be sandblasted off and recoated.
  - There is some rust staining on gutter grating surface that could be cleaned to improve aesthetics.
  - Most of the gutter grating appears to be in good shape for continued use, but there are a few areas where the broken grating should be replaced. A few areas have offsets or have gaps greater than 3/8" and will require adjustment to the grating.
  - Main drains and suction outlets do not meet federal VGB requirements and need to be updated.
  - Underwater lights don't get used and should be abandoned to reduce potential for leaks.
- Deck
  - Deck appears to be in decent shape aside from a few offsets and some cracking.
  - Ladder rails are in good shape for continued use.
  - Depth and warning markings need to be repainted.
  - Starting platforms appear to be in good shape for continued use.
  - Lifeguard stands appear to be in good shape for continued use.
  - Deck caulking needs replaced.
- Below-grade Piping
  - Piping was not observed during site visit but was tested by City staff. Findings are as follows:
    - Main drain has a cracked tee fitting.
    - The pump suction line between balance tank and pump shows ¾" drop of water in 24 hours. This could be due to air working its way out. If this pipe fails pressure testing, it will need to be repaired or replaced.

- The pool fill line has been tested/inspected and has been compromised.
- Treatment Systems
  - Currently using Sodium Hypochlorite for disinfection.
  - Need to consider replacement of valves.
  - Meters and gauges not functioning, and need replaced.
  - Electrical components showing corrosion but still functioning.
  - Water seeping into the pump pit from outside ground water. Consideration should be given to waterproofing pit.
  - Exterior filter tank coating is failing, and surfaces are rusting. Access port into the tanks is in rough shape with excessive corrosion. Filter tanks are showing signs of limited remaining life and should be considered for replacement.
  - Metal pipe supports, fittings, and hardware are significantly corroded.
  - Chemical treatment components were not in operation at time of observation. If any chemical feed component isn't functional, it should be replaced.
  - Pumps are functioning but there is significant corrosion on some of the pump volutes.
  - The balance tank has link seals that leak water and should be replaced.

#### **Outdoor Leisure Pool**

- Basin
  - Water surface area: 5054 s.f.
  - Overall, the basin appears to be in reasonably good shape for its age aside from several areas of wall at embedded components where surface has spalled and need patched.
  - The off-season water scum line is located at an elevation where underwater lights are located. Staff reports water flowing through underwater light conduits into pump pit. Underwater lights need to be abandoned and niches filled.
  - Coating is in rough shape with flaking, delamination, and worn areas. Walls and floor should be sandblasted and recoated.
  - Tile on walls is in poor shape and has come off in areas. Tile needs to be replaced.
  - Frog slide feature finishes have faded and showing some areas of failure. Recoating feature could be considered.
  - Sunshade in basin has history of hardware failures.
  - Skimmer weirs are missing and need to be installed in a number of skimmer boxes.
  - Spray features need recoating.
  - Main drains and suction outlets do not meet federal VGB requirements and need to be updated.
  - Waterwalk deck pads appear to be sufficient for continued use but missing anchors.
  - Damaged ladder inserts should be replaced/repared.
  - Exit apron of waterslide is open beneath and vulnerable to entrapment. It should be closed off.
  - Water ponds in piping just beyond wall suction outlets on the south side.
  - Ladder rails have been removed from their sockets.
  - Underwater lights don't get used and should be abandoned to reduce potential for leaks.

- Deck
  - Deck is in decent shape aside from a few offsets, some cracking, and ponding areas where deck has settled near balance tank. There is also some exposed rebar corrosion and spalling at skimmer boxes.
  - Sunshades have a history of hardware failures.
  - Depth and warning markings need to be repainted.
  - Waterslide structure and stairs has corroded in areas creating sharp and unsafe conditions. Some coating has delaminated from the galvanized finish beneath. The structure should be restored and recoated.
  - Waterslide flume has faded, but structurally appears to be in good shape. Joint sealant is needed.
  - Overhead lighting is not sufficient for night swimming.
  - Caulk isn't sealing joints and need to be redone.
  - Valves in the remote pump pit are aged and should be considered for replacement.
- Below-grade Piping
  - Piping was not observed during site visit but was tested/inspected by City staff. Findings are as follows:
    - Pump suction line between balance tank and pump had water loss.
    - The southernmost skimmer line held water.
    - The two northernmost skimmer lines did not hold water.
    - Inlet piping header drain line and a number of laterals are cracked.
    - Suction piping from suction outlets is compromised.
    - Spray bar and Sky Shooter feature piping had waterloss.
- Treatment Systems
  - Currently using Sodium Hypochlorite for disinfection.
  - Need to consider replacement of valves.
  - Meters and gauges not functioning, and need replaced.
  - Electrical components showing corrosion but still functioning.
  - Water seeping into the pump pit from outside ground water. Consideration should be given to waterproofing pit.
  - Exterior filter tank coating is failing, and surfaces are rusting. Access port into the tanks is in rough shape with excessive corrosion. Filter tanks are showing signs of limited remaining life and should be considered for replacement.
  - Metal pipe supports, fittings, and hardware are significantly corroded.
  - Chemical treatment components were not in operation at time of observation. If any chemical feed component isn't functionable, it should be replaced.
  - Pumps are functioning but there is significant corrosion on some of the pump volutes.
  - The balance tank has link seals (around the pipe penetrations) that leak water and should be replaced.
  - There's no way to fully drain the 8" skimmer header in the balance tank.

### **Summary of Condition of Pools**

Most municipal pool facilities have a lifespan of 40 years or more. This facility is just over 25 years old and has major issues.

The bathhouse/natatorium building were not a primary focus of this review. That said, it appears that the support buildings would have the ability to achieve the anticipated lifespan of the facility and could continue to be used to support the pools.

It appears that the Indoor pool appears to be in the best shape and most likely to extend to its expected life span with some repairs and with routine maintenance. However, the indoor pool was designed and constructed similar to the problematic outdoor pools and the piping was not tested/inspected to confirm the condition.

The Competition pool has some problems but still appears to have the possibility to extend its life with some needed repairs. The Leisure pool has major leaks and will require extensive repairs. The pool structure still has some life left. However, it has had a number of patches and will require more repairs in order to extend the life. Most of the Leisure pool below grade piping systems have been found to be compromised and would need to be replaced to extend the life of this pool.

Aside from the pool basin and piping, the support building (bathhouse/natatorium) appear to be capable of continued use with routine maintenance being performed as needed. However, subpar air quality is believed to be the reason for condensation and excessive corrosion in pool and mechanical areas. So an assessment of the building mechanical systems should be considered to address these concerns.

### **Probable Scope of Repairs**

Notes on the original design drawing sheet visually reflects (highlighted) compromised below-grade piping systems and the extent of likely repair areas. This drawing is attached.

It is worth noting that most of the repair scope associated with these pools is below grade and inherently has a higher level of unknowns. Further, given that these buried piping systems are in close proximity to each other, even piping systems that are not compromised now would likely need to be replaced once excavation begins. This is the approach that was taken as scope and cost of repair work is determined.

The collateral impact mentioned above also relates to other components of construction such as the waterslide, electrical, subgrade, and concrete deck. All of these are likely significantly impacted in order to perform below grade piping repairs and replacement. As with most repair and renovation projects, there remains a heightened possibility that the scope would need to increase due to unforeseen conditions.

### **Costs**

The opinion of costs is attached to this report. Note that the approach to the costs is focused on the pools and their treatment systems. Costs to modify or repair the existing bathhouse building are not reflected in the costs.

The new replacement costs from the spreadsheet reflect replacing the pool basins, piping, and treatment systems with all new pools of equal size. The existing building would be used to accommodate these new treatment systems.

The repair cost versus the replacement cost for the indoor is roughly half or less. Similarly, the repair cost for the competition pool is roughly half the cost of a new replacement pool. The Leisure pool repair cost is expected to be more than half the cost of a new replacement pool. The upper range of Leisure pool repair cost is about 70% of new replacement.

### **Feasibility of Repairs and Life Expectancy**

At roughly 25 years old, the facility could be considered beyond its “half-life”. It appears that it’ll take roughly \$1M or more to restore the Indoor pool and Competition pool to gain another 15 years or more. It may take nearly \$2M to restore the Leisure pool to that same level. With any repairs or renovation, there remains a portion of the facility that will always be older.

Consideration should also be given to current aquatic needs of the community. These current goals may differ from the goals of 25 years ago and therefore may determine the extent to which the City would invest in repairs or replacement options. It is a common trend for communities to replace their existing pool with a smaller and more efficiently used pool.

### **Summary of Recommendations**

We recommend that the City determine what their current aquatics goals are for their citizens. The ability of the current pool facility to meet these goals should be evaluated. If the current facility meets the goals, then the City should consider whether or not to repair or replace the pools and or specific components. If the current facility does not meet the goals, the City should consider pursuing a plan to provide a facility to achieve them.

I hope this review is of value to you. Please let me know if you have questions or comments for me.

Sincerely,

Michael J. Fisher, P.E.

Attachments: Opinion of Probable Costs  
Probable Scope of Repairs

# Opinion of Probable Construction Costs for Repairs and Replacement

Lamar Aquatic Center

Lamar, MO

Water's Edge Aquatic Design

January 12, 2022

Opinions of costs are with the assumption that the construction work would be performed under a Traditional (design, bid, build) delivery method and publically bid in the year 2022.

Pool	Repair Item	Repair (cost range)		Replace with New (Excludes buildings)	
<b>Indoor Pool (1165 s.f.)</b>					
Basin	Recoat pool	\$ 40,775	\$ 52,425		
	Main Drain VGB changes	\$ 12,000	\$ 20,000		
Piping	Address below grade piping (no known problems)	\$ -	\$ -		
Treatment	Replace water treatment systems	\$ 225,000	\$ 275,000		
		<b>\$ 277,775</b>	<b>\$ 347,425</b>		<b>\$ 655,313</b>
<b>Competition Pool (3230 s.f.)</b>					
Basin	Abandon U.W. lights	\$ 20,000	\$ 60,000		
	Repair cracked ladder steps	\$ 5,000	\$ 8,000		
	Replace hydrostatic relief valves	\$ 2,000	\$ 4,000		
	Main Drain VGB changes	\$ 12,000	\$ 20,000		
	Pool finishes (coating)	\$ 96,900	\$ 113,050		
	Weld SS gutter seams	\$ 10,000	\$ 15,000		
Piping	Repair cracked main drain tee	\$ 19,000	\$ 36,200		
	Change fill line (abandon existing; direct connect to potable water)	\$ 8,000	\$ 16,000		
	Pump suction line replacement (or testing and repairs)	\$ 10,000	\$ 60,000		
Treatment	New flow meters, valves, and gauges	\$ 15,000	\$ 25,000		
	Replace water treatment systems	\$ 350,000	\$ 425,000		
Misc.	Balance tank waterproofing work	\$ 10,000	\$ 20,000		
		<b>\$ 557,900</b>	<b>\$ 802,250</b>	<b>\$ 1,707,863</b>	
<b>Leisure Pool (5054 s.f.)</b>					
Basin	Abandon UW lights	\$ 20,000	\$ 60,000		
	Repair pool wall	\$ 5,000	\$ 10,000		
	Main Drain VGB changes	\$ 20,000	\$ 30,000		
	Pool finishes (tile and coating)	\$ 151,620	\$ 176,890		
	Replace missing skimmer components	\$ 5,000	\$ 10,000		
	Repair cracked ladder steps	\$ 5,000	\$ 8,000		
Piping	Pump suction line replacement (or testing and repairs)	\$ 70,000	\$ 168,000		
	Replace piping on west and south sides (slide disassembly and reassembly; demo, subgrade, and deck included)	\$ 720,000	\$ 965,000		
Treatment	New flow meters, valves, and gauges	\$ 15,000	\$ 25,000		
	Replace water treatment systems	\$ 350,000	\$ 425,000		
Misc.	Address slide structure issues	\$ 45,000	\$ 65,000		
		<b>\$ 1,406,620</b>	<b>\$ 1,942,890</b>		<b>\$ 2,729,160</b>
<b>Totals:</b>		<b>\$ 2,242,295</b>	<b>\$ 3,092,565</b>		<b>\$ 5,092,335</b>

